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COVID-19: Information and Communication Technologies on Pandemic Management

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COVID-19 was discovered in Wuhan, China, in December 2019 (Nah & Siau, 2020; Xie et al. 2020). As of November 2020, globally, there are more than 50 million people infected with COVID-19 and more than 1 million deaths. Different countries have different responses to the COVID-19 pandemic because of different economic developments and different cultures in each country. Information and Communication Technologies (ICT) have an impact on almost every industry (Siau & Long, 2009). This research focuses on understanding the effects of ICT on COVID-19 pandemic management.

In this research, we utilize the Human Capital Theory (HCT), which suggests that human capital is an important factor in the development of society (Sweetland, 1996), as our theoretical foundation. ICT can help with contact tracing, which is important for pandemic management. Better ICT also means that people have access to more data and up-to-date information (Siau & Shen, 2002). Thus, we hypothesize that countries with higher ICT development levels should be able to manage the COVID-19 pandemic better.

The dataset we used in this study includes the (i) ICT Development Index (IDI), which is the indicator of ICT from ITU data, (ii) population, and (iii) data related to Covid-19 (from January to July 2020) by countries from Our World in Data. The ICT dataset we used is from IDI 2017. We divided the data into five levels – each level is an increment of 20 percent from the previous level. The countries having the most Internet users are classified as level 5, and those with the least Internet users are in level 1. In this research, we conducted a two-way ANOVA test on the effects of ICT on the total cases and deaths of COVID-19. The results are exactly the opposite of our hypotheses. Further analyses, including the use of national cultures (Siau et al., 2010), are carried out to explain the results.

References

Nah, F. & Siau, K. (2020). COVID-19 Pandemic – Role of Technology in Transforming Business to a New Normal. Lecture Notes in Computer Science 12427, C. Stephanidis, G. Salvendy, J. Wei, S. Yamamoto, H. Mori, G. Meiselwitz, F. F.-H. Nah, & K. Siau (editors), Springer, 2020, 585-600.
Siau, K., Erickson, J. & Nah, F. (2010). Effect of National Culture on Types of Knowledge Sharing in Virtual Communities. IEEE Transactions on Professional Communication, 53(3), 278-292.
Siau, K. & Long Y. (2009). Factors Impacting E-Government Development. Journal of Computer Information Systems, 50(1), 98-107.
Siau, K. & Shen, Z. (2002). Mobile Commerce Applications in Supply Chain Management, 1(3), 3-14.
Sweetland, S. R. (1996). Human Capital Theory: Foundations of a field of inquiry, Review of educational research, 66(3), 341-359.
Xie, X., Siau, K., & Nah, F. (2020). COVID-19 Pandemic – Online Education in the New Normal and the Next Normal. Journal of Information Technology Case and Application Research, 22(3), forthcoming.